Estimating the Size of the At-Risk Populations

The best way to understand the effects of HIV on the communities in your planning area is to calculate rates of infection. Rates take into account that populations are different sizes and help us understand burden of disease by putting the disease case statistics in a common language. What may appear to be a small or inconsequential number of infections could be devastating to a small community. So we prefer to look at the case rate, or number of cases per 100,000 members of the subpopulation. We know that many of these populations will not have 100,000 members in reality. But that is exactly the power of rates; if there were, for example, 100,000 African American gay men in El Paso, this is how many AIDS cases and HIV infections would have been reported. Rates artificially equalize population size and allow you to compare small and large communities.

Rates require that we divide the number of cases of the disease we are interested in by the size of the population we are interested in. It is this second part that is the problem in HIV/AIDS work. While we know how many men or women, and how many African Americans, Hispanics or whites there are in the counties in your HMAZ(s) and LMAZ(s), there is not a standard estimate of how many MMS, IDU or FMS there are. Since the census, and other population-based surveys do not include questions about sexual or drug use practices, we need to make estimates of the size of at-risk populations, or more accurately - educated guesses .

Before we get to exactly how the estimates were calculated, keep these things in mind:

- **These estimates are conservative/minimum estimates.** We have looked at the available studies on estimates or measures for these sub-populations. When possible, we have used peer-reviewed articles for our estimates, and used lower population values if discrepancies between studies existed. The use of lower values may appear that we are minimizing the relative size of the population. But since are using these estimates for divisors for our rate calculations, if we use a smaller population size in our estimate, the rate will actually be higher than if we used a larger population estimate. In this way, we feel this method provides a safety margin that assumes the problem is larger than it might be rather than smaller. And we are erring in the same way for all populations.

- **These estimates use the same approaches for all planning jurisdictions.**

- **At this time, these are the best estimates we can do**. We will be periodically examining new data, and will continue to strive to have state and national surveys incorporate the types of information that we need.

M/MS Estimates

Many different estimates are available for the population of men who have sex with men. An article by Holmberg[1] and comments by others[2] effectively summarize many of the currently available estimates. Two that we have looked at rather extensively are 1) a technique based on US Census data in which the number of never-married men are used, with a fudge factor for race/ethnicity. The second technique uses specific estimates for certain large cities where in-depth studies have occurred, and extrapolating these values to the general population. Again, we understand that neither of these techniques measures the size of the population directly, unlike our prevention counseling reporting form which directly shows if a man who has had sex with another man in the past year, or since 1978. We have chosen the value of 4% of the male population to represent the size of the M/MS population. This is a consensus value supported by many studies identified in the Holmberg article. It is also fairly simple to calculate and can be done easily down to the county level, which can support our lowest common denominator for our morbidity and risk data collected in Texas. The size of the never-married male population is not currently available at the county level, and with the number of hoops that these numbers must jump through to get the estimate, we are more confident about the consistency of the 4% across the board value.

IDU Estimates

IDU populations are estimated based on a technique used by the CDC. This technique is based on observations in other studies cited by Holmberg that approximately 16% of the IDU population tests at publicly funded testing centers each year. A rough estimate of the IDU population can easily be obtained by dividing the number of IDUs tested each year by 0.16. In support of the use of this measure, statewide, the number of IDUs tested are similar from 1992 to 1998. Also, extrapolating the 1999 Prevention Counseling information, our population estimates for IDU heroin users is similar to the number of heroin users estimated by TCADA from analysis of treatment center information. Some areas may have low estimates of IDU population due to low testing numbers, which should be kept in mind when using IDU estimates for any reason.

F/MS Estimates

One of the frustrations in dealing with rates in this population is that most estimates of its size are so large that it produces very low estimates of rates of infection (the bigger the denominator, the lower the rate), and thus minimizes the impact of the epidemic on this

[1] Holmberg, SD. 1996. The estimated prevalence and incidence of HIV in 96 large US metropolitan areas. Am J Pub Health 86, 642-654.

[2] Samuel, MC and DE Osmond. 1996. Annotation: Uncertainties in the estimation of HIV prevalence and incidence in the United States. Am J Pub Health 86, 627-628.

population. We explored several methods for determining the size of the F/MS population, all based on some fraction of the general population size, subdivided by sex. The values finally considered were: **15%** of individuals surveyed by BRFSS claim to have tested in the past year at a publicly funded site; **4%** of individuals surveyed identified themselves at high-risk for HIV transmission; a complicated formula that looks at STD rates in general population and relates it to the STD history of individuals prevention counseled in 1999 which finally comes to **3.6%**. Since two of the values were similar, we determined that 4% would be a sufficiently small fraction of the general population to provide a realistic rate. Even using this small fraction, the size of all populations estimated far exceed the State's capacity to provide HIV prevention to all high-risk individuals.